US Army Corps of Engineers
New York District

Coney Island
Limited Reevaluation Report

Summary

Introduction

The Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island Area) shore protection project, as presented on November 26, 1991, in Section 1076 of the Surface Transportation Act of 1991, which authorized the construction of a protective beach along the 3.0 miles of the Coney Island public beach with periodic nourishment and construction of a terminal groin at West 37th Street. The project included the placement of a fillet of sand at Sea Gate adjacent to the western limit of shoreline improvement in order to preclude downdrift impacts and preclude groin flanking west of West 37th Street. The Surface Transportation Act of 1991 revised a project authorized in the Water Resources Development Act (WRDA) of 1986. Additional authority in WRDA 2000 provided for the construction of T-groins to improve sand retention in the Sea Gate area.

The shore protection project was constructed in late 1994. Beyond West 37th Street, fill placed in Sea Gate was beyond the limits of project-related storm damage protection and was placed in order to: (1) prevent flanking of the West 37th Street terminal groin; and, (2) prevent the fill volume in the Sea Gate reach from dropping below pre-project levels, and prevent the 0 feet National Geodetic Vertical Datum (NGVD) shoreline position from migrating landward of the pre-project position (base condition survey of November 1988). A renourishment interval of 10 years was determined to be the most cost effective for the project fill component, including the Sea Gate area.

Performance of fill placed over the 2.5-year period of monitoring following construction indicated that fill is being lost much more quickly in the Sea Gate reach than in the primary project area (West 37th Street to Corbin Place), and that a shorter renourishment interval, or an additional structural solution, may be appropriate for that reach. An opportunity exists to modify the project in order to limit future erosion and reduce renourishment in the Sea Gate area. Modifications could also be developed to prevent the shoreline at Sea Gate from returning to the 1988 (pre-project) beach profile, provide protection against flanking on the western side of the 37th Street groin, and simultaneously reduce the accumulation of sediment in Gravesend Bay. A revetment encircling the inshore downdrift end of the West 37th Street groin has been completed as

of March 2001 as part of a separate interim renourishment operation. This structure will protect the groin against flanking, but could suffer substantial wave impact combined with structure undermining with only a 10-year interval renourishment.

Alternatives Considered

Several alternative plans were considered to reduce the effects of shoreline erosion in the Sea Gate Reach, including: take no action/maintain status quo, beach fill with deposition basin, beach fill with revetment and deposition basin, beach fill with spur groin and terminal groin, beach fill with groin field, beach fill with offshore breakwaters, beach fill with T-groins, and perched or gravel beach. Analysis of the alternative plans was based upon a combination of factors, including: effectiveness; cost, and environmental and social impacts. Effectiveness is the ability of the measures to prevent groin flanking, prevent erosion to the 1988 shoreline, and prevent sediment accretion in Gravesend Bay.

Selected Plan

The selected alternative, Beach Fill with T-Groins, is the NED plan. This alternative achieves the three primary project goals of providing protection to the West 37th Street groin, reducing the accumulation of sand in Gravesend Bay and avoiding recession from the 1988 shoreline.

The selected plan, Alternative 7, Beach Fill with T-Groins, includes a beach berm with a crest elevation of 8.0 feet NGVD and a width of 100-feet. A ten-year cycle is proposed for renourishment. The estimated initial beach fill quantity is 189,000 cubic yards (cy). Renourishment volumes are 130,000 cy every 10 years. The T-Groin layout consists of 3 full T-Groins spaced 600 ft apart and 2 half T-headed groins at each end of the 2,500 ft long beach fill. Each structure is approximately 300 ft long with a total armor stone and core stone quantity of 50,000 tons.

The total project first costs for this alternative are $10,090,000. Beach renourishment costs were annualized over the project life assuming the construction would start in year 2003 and be completed by 2005. Average annual costs, including annualized first costs and renourishment costs, are $877,000 (October 2002 price levels, $5^{7/8}$ percent interest rate).

The analysis shows that the selected alternative is more economically feasible than the No Action alternative given that the No Action alternative provides none of the primary goals of protection to the groin, erosion reduction, avoiding the 1988 shoreline, and avoiding sand accumulation at Gravesend Bay. The costs required to implement the selected plan are within the existing authorized funding amount. Based on these findings, and subject to agency and public review, the District Engineer recommends that the proposed beach fill with T-Groins (Alternative 7) be authorized for implementation as a continuation of the existing project authority.